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Structural Transformation of Agricultural Sector in East Java Indonesia

Jahel Tarik Ibrahim¹, M. Zul Mazwan²

^{1,2}Lecturer, Agribusiness Department, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang
Jl. Tlogomas No. 246 Tlogomas, Babutan, Tegalpanda, Kec. Lowokwaru, Kota Malang, Jawa Timur 65144 Indonesia

Abstract

The agricultural sector has significant contribution to the economy in Indonesia. Nonetheless compared to the contribution of the non-agricultural sector, that of the agricultural sector is decreasing over year. In fact, the proportion of labor in the agricultural sector also has a downward trend over year. This indicates that there is a tendency that Indonesia experiences structural economic changes over time. This study aimed to (1) determine the structure of the macroeconomy in East Java Province, (2) determine the structural transformation of agriculture, population and employment in East Java Province. The data analysis methods were descriptive analysis and tabulation. The results of the study showed that (1) The economy of East Java Province is dominated by three main economic sectors, i.e. the agriculture sector, the manufacturing sector, and trade/transportation sector. (2) The pattern of the structural transformation of agriculture in East Java Province is in informal service sector (agriculture sector towards industry sector), while the structural transformation of the population and employment in this province is still in the primary sector or the agricultural sector.

Keywords - Agriculture, Informal Service Sector, Primary Sector, Structural Transformation.

INTRODUCTION

The agricultural sector is one of the sectors which have contribution to the economy in Indonesia. The contribution of the agricultural sector to Indonesia's average distribution of GDP in 2014-2017 was 13.41%, below the contribution of the industrial sector to GDP, i.e. 21.31% (Central Bureau of Statistics, 2018). Although both the agricultural and industrial sectors are the dominant sectors, if compared with the contribution of the non-agricultural sector, the contribution of the agricultural sector declined over year as shown in the data presented in Table 1 (Central Bureau of Statistics, 2016). According to Byerlee et al. (2008), Briones & Felipe (2013) and Yoshika (2014), the agricultural sector in developing countries is the sector with the highest labor absorption, but in several years this sector has a growth rate below the economic growth

rate. Therefore, the share of the agricultural sector to GDP declines over year, resulting in various problems including unemployment, inequality, and poverty.

Economic growth accompanied by transformation can be achieved by (1) improving the productivity of every sector and (2) mobilizing labor from sectors with low productivity to those with high-productivity (Todaro, M. P. dan Smith, 2006). Labor mobility takes place in two stages. The first stage is when the workers from the agricultural sector mobilize to sectors which have the same marginal productivity as the agricultural sector, i.e. the informal service sector. The second stage is when the workers in the informal service sector mobilize to the industrial sector (Budiharsono S., 1996). Employment transformation is also characterized by migration from rural to urban areas (urbanization) and labor mobility from the agricultural sector to the industrial and service sectors. One of the reasons for this mobility is the fact that urban areas offer higher real wages and more business opportunities.

Central Bureau of Statistics (2016) showed that the proportion of labor in the agricultural sector from 2004 to 2014 had a downward trend over year. This situation was inversely proportional to the proportion of labor in the non-agricultural and industrial sectors which had an increasing trend from year to year. This indicates that there were structural changes in labor from the agricultural sector to the non-agricultural sector. However, at the same time, the share of the agricultural sector in GDP in 2014 was only 12.1 percent, meaning that the economic transformation which is characterized by a decline in the contribution of primary sectors, including the agricultural sector, is not followed by employment transformation. This is because Indonesia, as a transforming country, is characterized by a large proportion of farmers who work on narrow land (less than 0.66 ha), and provides less opportunities for job creation and income growth.

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Jabal Tarik Ibrahim^{#1}, M. Zul Mazwan^{#2}

^{#1,2}Lecturer, Agribusiness Department, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang

Jl. Tlogomas No. 246 Tlogomas, Babatan, Tegalondo, Kec. Lowokwaru, Kota Malang, Jawa Timur 65144 Indonesia

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I. INTRODUCTION

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rate. Therefore, the share of the agricultural sector to GDP declines over year, resulting in various problems including unemployment, inequality, and poverty.

Economic growth accompanied by transformation can be achieved by (1) improving the productivity of every sector and (2) mobilizing labor from sectors with low productivity to those with high-productivity (Todaro, M. P. dan Smith, 2006). Labor mobility takes place in two stages. The first stage is when the workers from the agricultural sector mobilize to sectors which have the same marginal productivity as the agricultural sector, i.e. the informal service sector. The second stage is when the workers in the informal service sector mobilize to the industrial sector (Budiharsono S., 1996). Employment transformation is also characterized by migration from rural to urban areas (urbanization) and labor mobility from the agricultural sector to the industrial and service sectors. One of the reasons for this mobility is the fact that urban areas offer higher real wages and more business opportunities.

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Table 1. Share of Economic Sectors in GDP in Indonesia and Labor Share of Economic Sectors in Total Labor Share, 2004-2014

Sector Group	Primary				Secondary		Tertiary	
	Agriculture		Mining		GDP	Labor	PDB	Labor
	GDP	Labor	GDP	Labor				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2004	14.9	44.5	9.7	1.1	34.8	16.2	40.6	37.0
2005	14.5	45.2	9.4	1.0	34.7	16.9	41.4	36.9
2006	14.2	42.6	9.1	1.0	34.6	17.2	42.1	39.3
2007	13.8	41.9	8.7	1.0	34.3	17.0	43.2	40.0
2008	13.7	41.1	8.3	1.0	33.8	17.1	44.3	40.8
2009	13.6	40.7	8.3	1.1	33.4	17.0	44.8	41.2
2010	13.2	39.5	8.1	1.2	33.1	17.5	45.7	41.9
2011	12.8	36.4	7.7	1.3	32.9	19.6	46.6	42.7
2012	12.5	35.2	7.4	1.4	32.9	20.2	47.2	43.2
2013	12.3	34.8	7.1	1.3	32.9	19.1	47.8	44.8
2014	12.1	34.0	6.7	1.3	32.9	19.9	48.3	44.8
GDP/Labor 2014	0.355	5.153	1.653	1.078				

Source: Statistics Indonesia, 2016

Based on the abovementioned problems, it is likely that Indonesia, especially East Java Province, has experienced economic structural transformation over time, especially in the agricultural sector. The structural transformation of labor from the agricultural to non-agricultural sectors as mentioned above could certainly cause some problems in the transition process. A further study was conducted to elaborate the labor structure changes from the agricultural sector to non-agricultural sector which takes place in East Java Province. It is necessary to explain how the transformation takes place and what causes it in order to anticipate and direct future transformation so as to make it as expected. This study hopefully could be a reference for the government in creating alternative policies to support the development of the agricultural sector in East Java Province.

Objectives of Research

1. Determining the structure of macroeconomics in East Java Province.
2. Determining the structural transformation of agriculture, population, and employment in East Java Province.

II. RESEARCH METHOD

Location of Research

This study was conducted in East Java Province. The data were secondary time series data from 2010-2018 obtained from the Central Bureau of Statistics of East Java Province and the Department of Agriculture and Food Security of East Java Province.

Data Analysis Method

The analysis method was descriptive analysis and tabulation, i.e. examining the facts about (1) the economic structure of East Java Province in the last ten years; (2) the pattern of

structural transformation of agriculture, population and employment in East Java Province in the last ten years.

III. RESULTS AND DISCUSSION

Structure of Macroeconomics in East Java

Economic growth is an indicator that could show the changes in regional economic performance. With a quite high growth rate, it is expected that the productivity and income of the population will increase through job creation and business opportunities. Within 2010-2018, the economic condition in East Java Province was volatile. Based on GRDP at constant prices, the average economic growth rate in East Java Province in 2011-2018 experienced an increase or decrease in various sectors. The agricultural, forestry and fisheries sectors had a downward trend in the average economic growth rate (-0.1975 percent) (Central Bureau of Statistics, 2019). The details of the economic growth rate of East Java Province within 2011-2018 based on the agricultural sector, service sector and others, and the manufacturing sector are presented in Table 2.

Regional economic structure is reflected by the extent of the role of each sector in GRDP. Observations of the regional economic structure in a given period indicate whether any changes that take place in the economic structure could result in a shift in the economic structure from primary to secondary or from primary to tertiary. Shift in economic structure could lead to an increased macroeconomic productivity, followed by an increased regional income. Losch et al., (2012) stated that at the beginning of transformation processes, within-household diversification will only take place in diversification of agricultural commodities. At this initial stage, off-farm income is low, and both households and regions start to have specialization in

agriculture. Afterwards, the transformation continues on the diversification pattern between households and regions to develop a more diversified economy. When this structural transformation phase

begins, off-farm income will grow, leading to regional diversification.

Table 2. Distribution of Gross Regional Domestic Product (GRDP) Growth Rate of East Java Province

Category	2011	2012	2013	2014	2015	2016	2017	2018	Average
A. Agriculture, Forestry and Fisheries	-0.2	0.19	-0.01	0.1	0.09	-0.21	-0.6	-0.94	-0.1975
B. Mining and Quarrying	0.41	-0.56	0.04	-0.23	-1.18	-0.16	0.25	0.26	-0.14625
C. Processing Industry	-0.4	0.13	-0.49	0.16	0.36	-0.4	0.21	0.61	0.0225
D. Electricity and Gas Procurement	0.05	-0.02	-0.11	-0.01	-0.01	-0.02	0	-0.02	-0.0175
E. Water Supply, Waste Management, Waste and Recycling	0	-0.01	0	-0.01	0	0	0	0	-0.0025
F. Construction	-0.01	0.14	0.04	0.27	0	0.24	0.09	-0.11	0.0825
G. Wholesale and Retail Trade, Repairman	0.33	-0.3	0.03	-0.36	0.26	0.3	0.03	0.26	0.06875
H. Transportation and Warehousing	0.06	0.09	0.19	0.18	0.1	0.03	0.06	-0.01	0.0875
I. Provision of Accommodation and Eating Drinking	0.03	0.04	0.09	0.29	0.21	0.24	0.12	0.02	0.13
J. Information and Communication	-0.15	0.08	0.05	-0.24	0.02	0.03	0.03	-0.09	-0.03375
K. Financial Services and Insurance	0.05	0.16	0.2	0.04	0.06	0.04	-0.05	-0.02	0.06
L. Real Estate	-0.01	-0.03	0.02	-0.06	0.06	-0.02	-0.02	0.03	-0.00375
M, N. Company Services	-0.01	0	0.02	0	0.01	0	0.01	0.02	0.00625
O. Government Administration, Defense	-0.08	0.05	-0.14	-0.19	-0.01	0.02	-0.06	0.04	-0.04625
P. Educational Services	-0.02	0.13	0.1	0	-0.01	-0.05	-0.04	-0.04	0.00875
Q. Health Services and Social Activities	0.03	0.02	0.01	0.02	0	-0.01	0.01	-0.01	0.00875
R,S,T,U. Other Services	-0.08	-0.11	-0.03	0.02	0.05	-0.04	-0.03	0	-0.0275

Source: Statistics Indonesia, 2019

The economy in East Java is dominated by three main economic sectors, namely the agricultural sector, the manufacturing sector, and trade/repair sector. The contribution of these three sectors to the economy of East Java Province is around 60 percent. The manufacturing sector within the period 2010-2018 still made a dominant contribution, followed by the trade/repair sector and the agricultural sector. Nevertheless, the dominant

contribution was not accompanied by an increase in the amount of contribution. In fact, one of the reasons for the increased contribution of the agricultural sector is labor mobility from the agricultural sector to the non-agricultural sector because the incentives or wages and the commodity price guarantees received by those working in the agricultural sector were low (Tulangow & Timban, 2017).

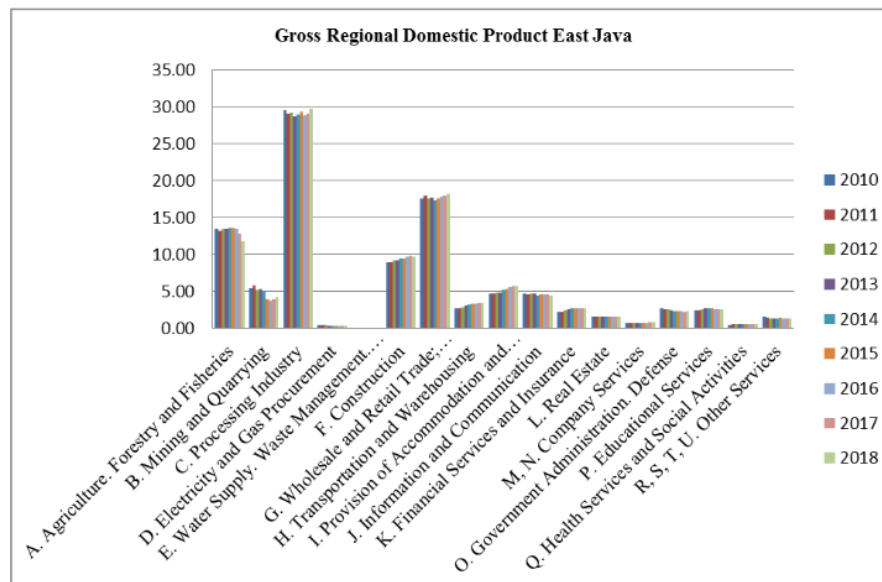


Figure 1: Diagram of Distribution of GRDP of East Java Province in 2010-2018

Other reasons for the labor mobility from the agricultural sector to the non-agricultural sector are (a) on average, they have narrow land area or even have no land; (b) the agricultural sector is considered to be dirty and risky, while giving less social prestige; (c) there is an imbalance between the quality of education and available employment opportunities in rural areas, evident by an increased number of young people in the rural areas who pursue higher education, making them more selective about employment; (d) there is an assumption that agriculture has high risks and low guarantees of the level, stability, and continuity of income; (e) the level of wages and income in agriculture is low, particularly for smallholder farmers; (f) there is only few employment opportunities in rural areas, and diversification of non-agricultural businesses and agricultural industries in rural villages are not wide open; (g) the level of succession of farm management to children is low, i.e. less than 40%, because most parents do not want their children to work like them; and (h) there is no specific incentive policy for young/novice farmers (Susilowati, 2016). Anwarudin et al. (2018) added that farmer regeneration is vital, especially in relation to sustainable agricultural. If farmer regeneration is neglected, it can be predicted that sustainable agricultural will not take place. Some factors that determine the regeneration of agricultural workers are the characteristics of the young generation, government support, family support, community support, market support, the roles of agricultural extension office, young generation's motivation, and the participation of young people in agriculture.

Structural Transformation of Agriculture in East Java

Structural changes also take place in the GRDP of the inter-sectors of agriculture. These structural changes are characterized by a decrease in the roles of the horticultural and livestock subsectors. At the same time, the share of the food crops and fisheries subsectors in GRDP experiences a sharp increase. This indicates that the food crops and fisheries subsectors are a potential source of growth in the future. This is also shown by the growth of the agricultural subsector at the national level (Central Bureau of Statistics, 2013). Therefore, in order to optimize such potential sources of growth, it is necessary to create a policy for the development of food crops and fisheries that bring more benefits for farmers and fishermen.

In fact, the changes in the direction of the GRDP of the agricultural sector are not always the same in all regions in Indonesia. According to the Central Bureau of Statistics (2013), the proportion of GRDP of the livestock sector in East Java declined, but increased significantly in Bali-Nusra, Kalimantan and Sulawesi. The structural transformation of agriculture is likely to take place according to the past trend, even though there will be various challenges and opportunities which affect the speed and direction of the changes in relation to environmental factors such as climate change, market instability, future technological breakthrough, and emergence of global value chains (Briones & Felipe, 2013).

Table 2 shows that the pattern of the structural transformation of the agriculture in East

Java Province in the last ten years was in the informal service sector, i.e. the transformation from the agricultural sector to the industrial sector. Data from the World Bank (2008) showed that a low share of the primary agricultural sector is a result of the growth of the secondary sector (manufacturing sector) which is positively correlated with poverty reduction. Nonetheless, this does not necessarily mean that the low share of the agricultural sector should make this sector neglected because the manufacturing sector is also dependent on the agricultural sector. According to Wheeler & Kay (2010), the low share of the agricultural sector is a signal that the agricultural sector has linkages in the aspects of output, job creation and income. In this context, the agricultural sector serves as a significant multiplier. In fact, the manufacturing sector will not develop if there is no support from the agricultural sector. Therefore, the manufacturing sector of any countries with agricultural stagnation will have slow development. According to Jacob Moscoba (2019), a more sustainable green revolution in agriculture will be able to produce food security globally, thus in-depth knowledge of the latest changes in the agricultural sector and their impact is very important.

An effort to address the issue of excess labor in the agricultural sector which is commonly found in rural areas can be made through the development of rural-based industries, which on the one hand are expected to absorb the excess labor, and on the other hand are able to bring added value to agricultural products. (Kristjanson, 2016) and Abay et al. (2018) added that more intensive and profitable agricultural management will improve the future prospects of farmers, by increasing access to technology, markets, finance, information and physical infrastructure. Besides, it is necessary for the government to add more funding allocation in the form of investment in the agricultural sector, regarding the fact that the transformation of labor is relatively more responsive to the changes in employment opportunities in the agricultural sector compared to those in the industrial and service sectors.

Tu & Long (2017) mentioned that it is crucial for rural restructuring to focus on the aspects of processes, mechanisms, rural planning technology systems, standards, policies and institutional innovations regarding rural restructuring and the impacts of globalization on rural restructuring. Miao (2000) also added that rural restructuring with rural industrial technologies, which are between traditional and modern, can minimize the economic and social costs of transformation and shorten the time needed to complete the structural transformation. Rural industrialization can also effectively absorb the excess labor in the agricultural sector and encourage the formation of new structures from agriculture, rural industries and urban industries.

Structural Transformation of Population and Employment in East Java

Based on data from Central Bureau of Statistics (2019), the total population of East Java Province was 37,565,706 people, and increased to 39,501,000 people in 2018. Thus, in the last 10 years, i.e. from 2010-2018, the population growth rate of East Java Province was 0.653 percent. In terms of the distribution among regencies or cities, the three most-populated regencies are Surabaya City, Malang Regency and Jember Regency with 2.8 million people, 2.5 million people, and 2.4 million people, respectively.

Labor mobility from the agricultural sector to the non-agricultural sector did not take place automatically, depending on the condition of the industrial sector. The requirements for labor mobility from the agricultural sector to the non-agricultural sector are: (1) there are many job opportunities offered by non-agricultural sector which are highly dependent on the types of technologies and market expansion of the industrial products. If most of the industrial expansion takes place in the upstream industry, then the level of labor absorption is not quite high because this industry generally uses capital-intensive technology. On the other hand, if an industry is labor-intensive and expansion takes place in the downstream industry, this will allow for increased labor mobility from the agricultural sector to the non-agricultural sector. (2) the quality of labor required by the non-agricultural sector can be met by the quality of labor from the agricultural sector, and (3) the real wages offered by the non-agricultural sector are higher than those offered by the agricultural sector. In fact, labor mobility from the agricultural sector to the non-agricultural sector is required for structural transformation to take place. The problem is that the labor mobility has not taken place as expected. As a matter of fact, many non-agricultural sectors use capital-intensive technology that requires less labor with high skills. On the other hand, the quality of the agricultural labor is less good and not yet ready to transform into the non-agricultural sector (industry and services). In addition, there are still many workers who work in the agricultural sector (Budiharsono S., 1996). In East Java, agricultural sector becomes the sector with the highest labor absorption although its distribution of GRDP in the total GRDP in East Java is not the highest (Table 3).

Table 3 shows that the agricultural sector dominates the labor absorption in East Java Province. There are 4,007,488 male workers and 2,636,055 female workers or a total of 6,643,543 workers who work in the agricultural sector. The sectors with the second highest labor absorption are the Wholesale and Retail Trade; Car and Motorbike Repair and Maintenance (3,696,514 workers). The sector with the third highest labor absorption is Manufacturing sector (3,247,537 workers). The data

show that the employment structure is still in the primary sector or the agricultural sector, In other

words, the agricultural sector still becomes the backbone for most of the population in East Java.

Table 3. Number of Working Population based on Main Business Activities and Gender (People) in 2018

Business Field Category	Number of Working Population based on Main Business Activities and Gender (People)		
	Male	Female	Male & Female
4 A. Agriculture, Forestry and Fisheries	4,007,488	2,636,055	6,643,543
B. Mining and Quarrying	155,281	19,531	174,812
C. Processing Industry	1,835,228	1,412,309	3,247,537
D. Electricity and Gas Procurement	47,415	5,471	52,886
E. Water Supply, Waste Management, Waste and Recycling	49,952	24,197	74,149
F. Construction	1,421,046	23,330	1,444,376
G. Wholesale and Retail Trade, Repairman	1,798,996	1,897,518	3,696,514
H. Transportation and Warehousing	567,851	31,551	599,402
I. Provision of Accommodation and Eating Drinking	485,090	794,681	1,279,771
J. Information and Communication	72,881	39,530	112,411
K. Financial Services and Insurance	155,000	81,427	236,427
L. Real Estate	25,184	10,830	36,014
M, N. Company Services	163,580	50,354	213,934
O. Government Administration, Defense	360,204	111,346	471,550
P. Educational Services	386,558	523,341	909,899
Q. Health Services and Social Activities	91,015	138,076	229,091
R,S,T,U. Other Services	452,174	575,459	1,027,633
Gross Regional Domestic Product	12,074,943	8,375,006	20,449,949

Source: Statistics Indonesia, 2019 (processed)

An unbalanced transformation between economic and employment structure is predicted to be the factor that causes labor productivity and community welfare in the agricultural sector to decrease (Yunisvita, 2011). Unfortunately, the government is unable to create enough jobs to provide employment opportunities to improve human resources. In addition, technological development and both agricultural and non-agricultural diversification, especially in areas with excess labor, should be directed at technological innovation which is labor-intensive in order to solve the problem of excess labor in these areas. Barrett et al. (2017) mentioned that households diversify their income in both agricultural and non-agricultural sectors. Non-agricultural profits are often reinvested in agricultural intensification. In fact, non-agricultural companies are also considered as a major vehicle to promote investment in agriculture. This will encourage a

healthy cycle between the productivity growth of agricultural and non-agricultural sectors. If there are no policies and investments to encourage agricultural productivity, there is a negative possibility that a decline in agriculture will be followed by an increase in poverty in rural areas, even in urban areas (Anríquez, 2007).

IV. CONCLUSION

The economy of East Java is dominated by three main economic sectors, namely the agricultural sector, the manufacturing sector, and trade/reparation sector. The contribution of these three sectors to the economy of East Java Province is around 60 percent. In fact, the labor of the agricultural sector still dominates the labor share in all the sectors. However, this is not accompanied by the share of the agricultural sector in the GDP in East Java.

The pattern of the structural transformation of agriculture in Malang Regency in the past ten years was in the informal service sector (the agricultural sector to the industrial sector). Meanwhile, the pattern of the structural transformation of population and employment were still in the primary sector or the agricultural sector. In fact, the agricultural sector is still the backbone of most of the population in East Java,

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